REMARKS

Claims 1-23 are pending and rejected in this application. Claim 1 is amended hereby. Claims 13, 14 and 23 are canceled hereby.

Responsive to the rejection of 1-6, 13-15 and 23 under 35 U.S.C. § 103(a) as being obvious by U.S. Patent No. 5,223,090 (Klungness et al.) and in view of material supplied by the Examiner from Chapter 13 of a "Handbook for Pulp and Paper Technologists," by Gary A. Smook, Applicants have amended claim 1, and have canceled claims 13, 14, and 23, and submit that claims 1-6 and 15 are in condition for allowance.

Klungness et al. '090 disclose a method of fiber loading a chemical compound. Calcium oxide (lime) or calcium hydroxide is mixed with dewatered crumb pulp having the desired level of moisture. The calcium oxide can be added to the water used for reconstituting dried fibers prior to adding the water to the fibers. Upon adding the calcium oxide to a dewatered crumb pulp and simple mixing for a period of a few minutes, the calcium oxide combines with the water to form calcium hydroxide within the mass of fibers in the pulp (column 6, lines 8-17). The calcium oxide or calcium hydroxide may be added at any desired level up to about 50%, based on the weight of the dry cellulosic material. The lower limit for addition of the calcium oxide may be as low as desired, but is preferably not less than about 0.1%. Most preferably, the calcium oxide or calcium hydroxide is present at a level of from about 10% to about 40%, on a per weight basis. Carbon dioxide is added at a level sufficient to cause complete reaction of the chemical with the gas to form calcium carbonate (column 6, lines 38-48). In the case of paper pulp, the paper pulp can be immediately transferred to a papermaking operation where it is formed into a slurry, refined and placed onto a Fourdrinier machine or other suitable papermaking apparatus (column 6, lines 56-59). The precipitation of calcium carbonate in cellulosic fibers containing from about

40% to about 85% moisture (15% to 60% of fiber) and loaded with from about 10% to about 40% of calcium oxide or calcium hydroxide is easily effected in a pressurized container with low shear mixing. The carbon dioxide pressure in the container is preferably from about 5 psig to about 60 psig, and the low shear mixing is preferably continued for a period of from about 1 minute to about 60 minutes. It has also been determined that for fibers containing from about 95% to about 85% moisture (5% to 15% of fiber) and the same calcium oxide loading, that high shear treatment during contact with the carbon dioxide is required to cause complete precipitation of calcium carbonate (column 6, line 64 through column 7, line 11). A simple way to provide contact of the carbon dioxide with the paper pulp under high shear treatment is by use of a pressurized refiner. The refiner is a cylindrical hopper into which the paper pulp is loaded. The cylindrical hopper is gas tight and can be pressurized with a gas. A rotating shaft containing beater arms is disposed within the hopper to keep the paper pulp from matting. An auger screw is located beneath the hopper for conveying the paper pulp into the interior space between a set of matched discs. The discs shred the pulp crumbs as the pulp passes therebetween. Prior to forcing the pulp into contact with the rotating one of the matched discs, the carbon dioxide is pumped into the sealed hopper to pressurize the hopper, the carbon dioxide remaining in contact with the pulp while the paper pulp is stirred in the hopper and while the pulp is being transported by the auger through the refiner discs (column 7, lines 16-41). In a typical refiner run procedure the pulp, calcium reactant and water are first mixed in a steel bowl using a Hobart mixer. The high consistency pulp is then loaded into a hopper of a refiner which is closed and sealed. Therein the pulp is then refined in a carbon dioxide atmosphere (column 8, lines 17-51).

Smook discloses fiber shortening that occurs during refining is mainly due to the shearing action of the bar crossings of the refiner. An obvious effect of refining is the dramatic change in the drainage or dewatering properties of the pulp. Pulp drainability is rapidly reduced as refining

proceeds, mainly due to the increased concentration of fines (page 197).

In contrast, claim 1 recites in part: "loading said fibers with a precipitation product, without mechanically treating the fiber stock to improve a freeness value of said fibers; mechanically treating said fibers after said loading step, whereby said mechanically treating step improves said freeness value of said fibers; . . .". (Emphasis added). Applicants submit that such an invention is neither taught, disclosed nor suggested by Klungness et al. '090 and Smook, or any of the other cited references, alone or in combination, and has distinct advantages thereover.

Applicants respectfully submit that the term "freeness" has a specific meaning in the papermaking art, i.e., freeness is a term used to define how quickly water is drained from the pulp (see for example http://www.paperonweb.com/dict.htm).

Klungness et al. '090 disclose a method of fiber loading a chemical compound, including a high sheer treatment utilized within a pressurized refiner. Pressurized carbon dioxide is pumped into a sealed hopper and the pulp comes into contact with rotating matched discs, which refine the fibers, and which improves the contact of carbon dioxide with the paper pulp and has no effect on the freeness value of the fibers. Smook discloses fiber shortening that occurs during refining is mainly due to the shearing action of the bar crossings of the refiner. Klungness et al. '090 and Smook fail to disclose or suggest loading the fibers with a precipitation product, without mechanically treating the fiber stock to improve a freeness value of the fibers; and mechanically treating the fibers after the loading step, whereby the mechanically treating step improves the freeness value of the fibers.

An advantage of the present invention is a method that renders a drastic reduction in the refining energy for fiber stock without negatively impacting the characteristics of the paper that is being produced from these fibers.

Responsive to the rejection of claims 7-12 under 35 U.S.C. § 103(a) as being obvious by U.S. Patent No. 5,223,090 (Klungness et al.) in view of US Patent No. 6,059,924 (Hoskins) and Smook, Applicants submit that claims 7-12 depend from claim 1. The amendment to claim 1 described above distinguishes claim 1, and any dependent claims including claims 7-12, from the cited prior art including Klungness et al. '090, Hoskins ' 924 and Smook. For all of the foregoing reasons, Applicants submit that claims 7-12 are now in condition for allowance, which is hereby respectfully requested.

Responsive to the rejection of claims 16-22 under 35 U.S.C. § 103(a) as being obvious by U.S. Patent No. 5,223,090 (Klungness et al.) in view of Smook and U.S. Patent No. 5,954,283 (Matthew), Applicants submit that claims 16-22 depend from claim 1. The amendment to claim 1 described above distinguishes claim 1, and any dependent claims including claims 16-22, from the cited prior art including Klungness et al. '090, Smook and Matthew '283. For all of the foregoing reasons, Applicants submit that claims 16-22 are now in condition for allowance, which is hereby respectfully requested.

For the foregoing reasons, Applicants submit that no combination of the cited references teaches, discloses or suggests the subject matter of the amended claims. The pending claims are therefore in condition for allowance, and Applicants respectfully request withdrawal of all rejections and allowance of the claims.

In the event Applicants have overlooked the need for an extension of time, an additional extension of time, payment of fee, or additional payment of fee, Applicants hereby conditionally petition therefor and authorizes that any charges be made to Deposit Account No. 20-0095, TAYLOR & AUST, P.C.

Should any question concerning any of the foregoing arise, the Examiner is invited to telephone the undersigned at (260) 897-3400.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: MS Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on: October 24, 2005.

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October 24, 2005
Date